



Environmental Protection Agency Research Laboratories and Centers National Exposure Research Laboratory

The EPA's Office of Research and Development (ORD) is organized into three national laboratories, three national centers, and two offices located in a dozen facilities around the country and in Washington, DC. These labs, centers, and offices provide expertise, information and technical support to EPA program offices, regions, state/municipal/tribal governments, and other agencies performing environmental research, assessment, and risk management. The ORD scientists also collaborate with private-sector partners to address important environmental issues.

The **National Exposure Research Laboratory (NERL)** provides information to increase the accuracy of EPA's exposure and risk assessments for factors that stress the environment, including chemicals, living organisms, radiation, changes in land and water use, and changes in climate. The NERL also evaluates innovative technologies to improve exposure assessment and provides information on stressor sources, pollution transport and fate, and human exposure to pollutants.

NERL's headquarters and two of its research divisions are located in Research Triangle Park, NC. Other research divisions are located in Athens, GA, Cincinnati, OH, and Las Vegas, NV. NERL is composed of 450 EPA employees including 295 principal investigators and managers of science.

For more information about NERL's areas of concentration and current research, please visit www.epa.gov/nerl



OFFICE OF RESEARCH AND DEVELOPMENT

*building a
scientific foundation
for sound
environmental
decisions*

POLLUTION FROM PERSONAL ACTIONS AND ACTIVITIES – PHARMACEUTICALS AND PERSONAL CARE PRODUCTS (PPCPs): RESEARCH AT NERL-LAS VEGAS

The occurrence of pharmaceuticals and personal care products (PPCPs) as trace environmental pollutants is a multifaceted issue whose scope of concerns continues to expand. PPCPs comprise thousands of distinct chemicals from numerous therapeutic and consumer classes. They typically occur as trace environmental pollutants (primarily in surface but also in ground waters) as a result of their widespread, continuous, combined usage in a broad range of human and veterinary therapeutic activities and practices. With respect to the risk-assessment paradigm, the growing body of published work has focused primarily on the origin and occurrence of these substances. Comparatively less is known about human and ecological exposure, and even less about the documented or potential hazards associated with trace exposure to these anthropogenic substances, many of which are highly bioactive and perpetually present in many aquatic locales. The continually growing, worldwide importance of freshwater resources underscores the need for ensuring that any aggregate or cumulative impacts on water supplies and resultant potential for human or ecological exposure be minimized.

Of the many facets involved in this complex issue, that of sources/origins and environmental occurrence, is the better understood end of the larger spectrum. The potential for adverse ecological or human health effects (especially from long-term, combined exposure to multiple xenobiotics at low concentrations) is the largest unknown.

Beginning in the late 1990's, the Environmental Chemistry Branch (ECB) at NERL-Las Vegas became involved in several international activities involving PPCPs. This initial work has now evolved into a lead role at EPA. ECB's work is captured on the Agency's PPCPs web site (<http://www.epa.gov/nerlesd1/chemistry/pharma>), which is the only comprehensive site in the world devoted to this topic. The web site serves as a central point of access and major public outreach tool for a wide array of materials and information.

ECB's role serves in part to catalyze research and to foster collaborative efforts. In the span of the last 4 years, what had originally been a predominantly European-led effort, now involves researchers from other federal agencies (esp. CDC, FDA USDA, and USGS), other countries (e.g., Health Canada), and universities (e.g., EPA STAR grants targeted to PPCPs).

ECB also has a range of in-house efforts (e.g., see: <http://www.epa.gov/nerlesd1/chemistry/pharma/new.htm>) aimed at development of new analytical approaches for: (i) trace analysis (e.g., for the ubiquitous, widely used synthetic musk fragrances), (ii) chemical analysis for various veterinary pharmaceuticals used in confined animal feeding operations (esp. organoarsenicals), (iii) using PPCPs as tracers of leaking septic systems, and (iv) identification of pollutants not amenable to conventional approaches ("environmental forensics"). ECB is currently involved in championing the need for environmental stewardship programs to minimize the introduction of PPCPs to the environment.

Contact Information:

Christian G. Daughton, Ph.D.
Chief, Environmental Chemistry Branch
U.S. Environmental Protection Agency
ORD/NERL-ESD

Phone: 702-798-2207
Email: daughton.christian@epa.gov